

Followup Review of the 1997 Integrated Safety Management Evaluation at the Brookhaven National Laboratory

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Abbreviations Used in This Report

AGS	Alternating Gradient Synchrotron
ALARA	As Low As Reasonably Achievable
AUI	Associated Universities, Inc.
BHG	DOE Brookhaven Group
BLIP	Brookhaven Linac Isotope Producer
BNL	Brookhaven National Laboratory
BSA	Brookhaven Science Associates
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
DOE	U.S. Department of Energy
ER	DOE Office of Energy Research
ES&H	Environment, Safety, and Health
ESHS	Environment, Safety, and Health Services Division
FSS	Facilities Support Section
FTE	Full Time Equivalent
FY	Fiscal Year
HFBR	High Flux Beam Reactor
JSA	Job Safety Analysis
NSLs	National Synchrotron Light Source
ORPS	DOE Occurrence Reporting and Processing System
PEP	Process Evaluations Project
RHIC	Relativistic Heavy Ion Collider
SEAPPM	Safety and Environmental Administrative Policy and Procedures Manual
VOC	Volatile Organic Compound

Executive Summary

Scope

The Department of Energy (DOE) Office of Oversight conducted an integrated safety management evaluation at Brookhaven National Laboratory (BNL) during the period of February-April 1997. The Office of Oversight also conducted an interim review of tritium contamination of groundwater around the High Flux Beam Reactor (HFBR) in January-February 1997, and an August 1997 followup review on the effectiveness of DOE and BNL efforts to identify and eliminate the source of the tritium leak and mitigate the tritium groundwater plume at the HFBR. The Office of Oversight followup review reported here focused on three technical areas identified during the integrated safety management evaluation as having significant weaknesses: work planning and control, occupational radiation protection, and the groundwater protection program. This review also evaluated the effectiveness of the DOE Brookhaven Group (BHG) in monitoring and assessing the laboratory's environment, safety, and health (ES&H) performance. BNL's approach in developing a management plan to address ES&H program management deficiencies was also reviewed, and the results were provided to the site. A followup review of management system deficiencies identified during the 1997 integrated safety management evaluation is planned for 1999.

Results

There have been improvements in most of the areas evaluated during this followup review. The work planning and control initiatives that are in the early stages of implementation, both Laboratory-wide and in the facilities, are already having a positive impact. These initiatives include a new Laboratory-wide standard on work planning and control; a revised standard on experimental control; draft implementing procedures on work planning and control for all departments/divisions; a sitewide stop-work policy; sitewide draft procedures for stop-work and lockout/tagout; and several training initiatives. Improvements in the consistency,

clarity, detail, and documentation of hazards and hazard controls are evident. Facility managers recognize the benefits from increased formality in work control processes, and there appears to be an increased awareness of ES&H issues at BNL. Continued management attention will be needed to ensure that the full implementation of the work control initiatives is effective in improving safety and the communication and control of hazards. Management attention is also required to establish milestones for implementing draft procedures on stop-work and a building management system.

Progress toward improving the BNL radiological control program has been limited. The weaknesses identified during the 1997 integrated safety management evaluation still exist, and a clear, comprehensive path forward for addressing these weaknesses has not been established. BNL still does not demonstrate the basic program infrastructure and leadership needed to ensure that appropriate radiological controls are established and properly implemented. BNL has begun several initiatives, such as the 10 CFR 835 gap analysis, that are designed to improve the radiation protection program; however, these initiatives do not address many of the existing program weaknesses. Laboratory management has reacted to individual incidents and events and has not effectively implemented corrective actions addressing the fundamental program and performance deficiencies that have been repeatedly identified by incidents and assessments. On the other hand, BHG oversight of the BNL radiation protection program has significantly improved. BHG is actively participating in the BNL initiatives, and BHG personnel have increased their presence in BNL facilities, observing radiological work and assessing performance. However, BNL has not adequately utilized the information provided by BHG as a result of these activities to determine the root causes of identified deficiencies or to prioritize areas for improvement.

BNL has made significant progress in site remediation and groundwater protection. Since tritium was discovered in the groundwater south of HFBR in 1997, BNL has aggressively pursued the identification of radiological contaminant

sources and the interim remediation and control of identified source areas. The number of systems at BNL subject to regulation by Article 12 of the Suffolk County Sanitary Code doubled as a result of the BNL Facilities Review. A comprehensive Groundwater Protection Management Plan is under development, but BNL has not issued it or established procedures to formalize facility groundwater protection requirements. Despite improvements, communications on groundwater issues both within BNL and BHG and with regulators and stakeholders are not fully effective.

BHG has begun a number of positive initiatives to improve their oversight and assessment program since the 1997 integrated safety management evaluation. The BHG ES&H Management Plan and Operational Awareness Program document define the BHG oversight strategy and clarify roles and responsibilities. BHG office implementing procedures are being revised to reflect the current organization and activities. Increased staff and continuing upgrades to the Facility Representative and technical specialist programs have resulted in an increased DOE presence and active involvement in monitoring operations at BNL facilities. Formal assessments of BNL have been conducted, and assessment results are documented in formal reports that are provided to BNL. BHG is developing databases to track issues, assessment findings, and DOE Occurrence Reporting and Processing System (ORPS) corrective actions, but a formal mechanism for communicating operational awareness results to the contractor has not been established. BHG also does not routinely analyze or

trend the database information to identify and correct systematic management system or programmatic weaknesses. BHG is steadily progressing toward full implementation of their oversight program and is actively engaged in efforts with BNL to achieve the mutual goal of improved safety performance.

Conclusions

BNL has made significant progress in work planning and control initiatives and in groundwater protection and restoration activities. Although the effectiveness of the work planning and control initiatives could not be determined because of the early stages of implementation, the current initiatives, coupled with BNL staff's recognition of the need to formalize and document processes, are encouraging. There have been only limited improvements to the BNL radiological control program since the 1997 Oversight evaluation, and corrective actions have not been developed to address the fundamental program and performance deficiencies that have been repeatedly identified by incidents and assessments. Continued management attention is also needed to ensure that the comprehensive Groundwater Protection Management Plan is issued in a timely manner.

BHG has improved its oversight and assessment of BNL since the 1997 evaluation. Although many programs are still evolving or in the early stages of implementation, formal assessments of BNL programs have been completed, and BHG is actively involved in many facility activities.

In addition to evaluating safety and security management, the mission of the Department of Energy (DOE) Office of Oversight includes a commitment to ensure that issues or concerns identified during evaluations and accident investigations are brought to a satisfactory resolution in a timely manner. To meet this commitment, the Office of Oversight monitors progress in implementing general programmatic improvements on both a complex-wide and site-specific basis.

The objective of this followup review at Brookhaven National Laboratory (BNL), conducted onsite during the period of July 27 through August 5, 1998, was to evaluate the status and effectiveness of actions taken in response to weaknesses identified during the February - April 1997 integrated safety management evaluation at BNL. The review focused on three technical areas identified during the evaluation as having significant weaknesses: work planning and control, occupational radiation protection, and the groundwater protection program. These technical areas were evaluated by assessing programs, procedures, and activities associated with the following facilities: Alternating Gradient Synchrotron (AGS), National Synchrotron Light Source (NSLS), High Flux Beam Reactor (HFBR), and Brookhaven Medical Research Reactor. The review also evaluated the effectiveness of the DOE Brookhaven Group (BHG) in monitoring and assessing the Laboratory's environment, safety, and health (ES&H) performance, primarily in the above technical areas. At the request of BHG, BNL's approach in developing a management plan to address ES&H program management deficiencies was also reviewed, and the results were provided to the site. A followup review of management system deficiencies identified during the



Brookhaven National Laboratory

1997 integrated safety management evaluation is planned for 1999.

BNL is a multi-program non-defense laboratory whose primary mission is to perform basic and applied research in a multitude of scientific disciplines, including experimental and theoretical physics, medicine, chemistry, biology, environmental sciences, and engineering. BNL was originally established in 1947 to bring the resources of American academia and government together to advance scientific research and build user facilities beyond the capability of any single university.

Brookhaven Science Associates (BSA) became the operating contractor at BNL on March 1, 1998. The previous contractor, Associated Universities, Incorporated (AUI), was responsible for Laboratory operations from the Laboratory's establishment in 1947 until the Secretary of Energy terminated the contract with AUI on May 1, 1997. BSA is a company formed by the State University of New York at Stony Brook and Battelle Memorial Institute.

BNL contract activities are managed by BHG, which receives guidance from DOE program offices and reports to the Secretary through the Director, Office of Energy Research (ER). On May 1, 1997, the Secretary appointed an Executive Manager of BHG, reporting directly to the Secretary, to oversee operations during the transition to a new contractor. The reporting relationship of BHG to ER was approved on May 6, 1998, and a new BHG Manager was appointed on June 29, 1998.

In addition to the 1997 integrated safety management evaluation, the Office of Oversight conducted an interim review of tritium contamination of groundwater around the HFBR in January-February 1997, and an August 1997 followup review on the effectiveness of DOE and BNL efforts to identify and eliminate the source of the tritium leak and mitigate the tritium groundwater plume at the HFBR. This followup review includes an assessment of the progress made in improving the groundwater protection program at BNL.

2.1 Work Planning and Control

Background

The April 1997 Oversight evaluation identified significant programmatic and work performance deficiencies that resulted in a lack of consistent implementation of the five core functions (identify work, analyze hazards, implement controls, perform work, and feedback and improvement). The evaluation identified instances of unsafe work and deficiencies in all five core functional areas. BNL did not have sitewide procedures that provided a standard method for interaction of Plant Engineering personnel or other subcontractors with BNL facilities during work activities. While some facilities, such as AGS, had prescriptive work control procedures for external work, others did not. NSLS and AGS documentation of hazard analyses and routine work activities varied significantly. BNL had a Laboratory standard on experimental work, but lacked a standard or other institutional guidance directly addressing work planning and control. Some facilities, such as HFBR, had formally documented work control programs, but internal work control programs at other facilities did not fully document many routine, day-to-day work activities and associated hazard screenings and analyses. The integrated safety management evaluation also identified weaknesses in the building management and stop-work programs. These programs were not supported by a comprehensive policy and implementing procedural documents.

Results

Since the 1997 Oversight evaluation, there has been significant progress on initiatives affecting work planning and control at all facilities. These initiatives include a new Laboratory-wide standard on work planning and control; a revised standard on experimental control; draft implementing procedures on work planning and control for all departments/divisions; a sitewide stop-work policy; sitewide draft procedures for stop-work and lockout/tagout; and several training initiatives. Many of

these draft procedures are in various stages of trial implementation to identify problems before full implementation. A sitewide work planning and control committee, composed of departmental work control managers and chaired by the Plant Engineering Division, has been active in guiding the process to maintain consistency across the site. Additionally, an experienced ES&H mentor is assisting in developing and implementing institutional work control initiatives. This followup evaluation identified some improvements in consistency and documentation of work activities resulting from this process. Because many of the sitewide, department, and division changes are very recent, and some are still in draft, the Office of Oversight could not evaluate the effectiveness of their implementation. The Oversight review team conducted walkdowns at several facilities, including HFBR, AGS, and NSLS, to observe work activities and facility conditions. Few deficiencies were identified during the walkdowns. However, as discussed later in this section, the review team identified deficiencies in one maintenance task involving electrical hot-work permits at HFBR.

Institutional Programs

The new Laboratory standard on work planning and control is intended to improve control and consistency of work activities across the site when fully implemented. Most department/division implementing procedures are still in draft; several departments/divisions are implementing the standard on a trial basis using draft procedures. The initial results are positive. There has been improvement in the control of work activities, but continued emphasis on implementation is needed. Identification and documentation of routine day-to-day work, a significant weakness from the 1997 integrated safety management evaluation, has also improved. The process is evolving and requires continued management attention to ensure consistent implementation of the work planning and control standard sitewide. One area for improvement is the development of a sitewide job safety analysis (JSA) process to standardize activity-level hazard analysis in support of the new work planning and control standard.

BNL revised the sitewide Laboratory standard to strengthen experimental review, and facility experimental review procedures were correspondingly revised. The revised procedures generally provide for adequate screening, review, and evaluation of new experiments and changes in experiments. One concern is that the NSLS experimental review process relies heavily on a single experimental coordinator to identify which experiments do not require additional review by the Experimental Review Committee. A second review of such experiments would serve to ensure that all experiments fall within the established controls from prior experimental reviews.

Since the 1997 integrated safety management evaluation, there have been improvements in other programs affecting work planning and control, such as the stop-work and lockout/tagout programs. In the absence of a sitewide stop-work procedure, several steps have been taken to improve the stop-work program: a revised stop-work policy (issued in April 1997), an ES&H hotline, a policy on safety responsibility and accountability, draft revision of the employee handbook that includes stop-work guidance, Brookhaven Bulletin articles on stopping work, worker surveys, and inclusion of stop-work guidance in supervisors and orientation training. These actions have raised awareness of stop-work policy and requirements. The draft BNL ES&H standard (procedure), if implemented as written, would solidify the process and provide implementation requirements and processes to implement the policy. At the time of this followup review, there was no established milestone for having an approved procedure implemented. The BNL requirement to conduct multiple worker and departmental surveys to gain full consensus on the details of the procedure may significantly delay procedure approval and implementation. For electrical safety, BNL issued an improved Laboratory standard on electrical safety and drafted a new lockout/tagout standard that is in final review. These documents, if effectively implemented, will improve consistency in energy isolation and electrical safety.

Facility-Level Programs

AGS has taken several steps to improve the work control process. These include an enhanced work control procedure, formal coordination meetings, formal assignment of job planners, adoption of the site common work permit for all external work, and prescribed methods for AGS groups to document routine, day-to-day, low-hazard tasks. All groups now screen and document work activities into low-, moderate-, and high-risk tasks. Informal processes for work control within the various technical groups have been strengthened and documented. There has

been significant improvement in the trouble reporting system, a system used to define emergent work during beam operation. Because many of these changes are very recent, the Oversight review team could not evaluate the effectiveness of their implementation. AGS still uses a variety of work control processes and systems to perform routine day-to-day work activities. These processes have not yet been further consolidated to consistently apply the Laboratory work planning and control standard requirements. Adoption of the site standard work control form for internal moderate- and high-hazard work could further improve consistency and reduce reliance on the multiple systems that are now in place. Some procedural and implementation deficiencies with newly revised procedures were identified; AGS recognizes and plans to correct these deficiencies.

NSLS is piloting the work control system and forms in the Laboratory work planning and control standard on a trial basis. The system is in use for all external work and is being implemented for internal work, including low-hazard work. Although implementation is not final and evaluators identified minor deficiencies, there has been significant improvement in work activity documentation at NSLS.

During the 1997 Oversight evaluation, HFBR's formal work planning and control program showed few deficiencies. This program has continued and gained some consistency with the rest of the site as a result of the sitewide work planning and control standard. However, evaluators found that the sitewide work permit form is not well integrated into HFBR procedures. Procedures to integrate the work permit form were in draft and did not adequately describe how the sitewide work permit is used.

Facility Walkdowns

Walkdowns at AGS, NSLS, and HFBR generally indicated that the facilities were well maintained, orderly, and improved from the 1997 integrated safety management evaluation. Because AGS and NSLS were in full operation, no maintenance work was observed at those facilities. At HFBR, the reactor was shut down and defueled. The team reviewed the work plan for replacing single-wall purification piping with double-wall piping and attended work planning meetings. The work plan was comprehensive, and planning meetings were well attended by an appropriate cross-section of disciplines involved in the task.

During HFBR walkdowns, evaluators identified deficiencies associated with electrical hot work permit implementation for a control room surveillance. Personnel observed inside a hot work permit boundary had not removed all conductive material from their persons. Review of the hot work permit and associated

procedures identified additional deficiencies. The procedure used in conjunction with the generic hot work permit (BNL-RIG-590-6, Revision 1), did not contain any electrical hazard warnings as required by Section 6.4.1.6 of the Reactor Division electrical safety procedure. Furthermore, the control zone did not extend three feet on either side of the equipment as required, and HFBR operators had not signed the Operations hot work permit as required by the Reactor Division electrical safety procedure. A June 15, 1998, Laboratory Electrical Safety Committee interpretation memorandum specifies that the control zone shall be the Flash Protection Boundary or the Limited Approach Boundary, whichever is greater, and further specifies that anyone working within the control zone must wear appropriate personal protective equipment. The boundaries for Range B electrical work are 3-1/2 feet. Reactor Division staff indicated that they had not yet reviewed the task procedures as required by the Reactor Division electrical safety procedure. Since the staff indicated that this type of surveillance work was common, BNL has evidently not addressed this issue on a generic basis.

Program Progress

Because of the change in the Laboratory contractor, some initiatives that started after the 1997 integrated safety management evaluation have been refocused. The Laboratory management change and refocusing, though necessary, have somewhat delayed progress in implementing final procedures and programs affecting work control. For example, the 1997 Oversight evaluation identified that the building management procedure had been in draft for two years without final approval and implementation. The building management procedure was intended to define roles and responsibilities for building managers, ensure accountability, define coordination for facility and work control issues, and define interfaces between building managers and departmental ES&H coordinators. BNL revised the procedure after the 1997 evaluation, but the procedure still remains in draft. A milestone date for approval and implementation of the building management procedure is not evident. Some BNL departments and divisions are awaiting institutional guidance from ongoing management initiatives before acting to resolve issues identified during the integrated safety management evaluation.

There have been cultural improvements since the 1997 evaluation in "safety attitude," recognition of ES&H issues, and the need for more formalized work control processes at the Laboratory. The ES&H Division and line organizations have recognized the need to formalize processes and procedures that would improve work planning and control, and facility

organizations appear more receptive to program improvement.

Positive Attributes

BNL has developed a Laboratory standard that addresses work planning and control. The standard is in the process of being implemented sitewide. The standard provides a consistent approach to sitewide work planning and control and mandates the use of a common work permit for all department/division external work. Although the use of the common work permit for internal work is optional, most line organizations have adopted the common form for both internal and external work, thereby improving the consistency of work controls. The Laboratory standard requires assignment of work control managers for all facilities to improve uniformity in work planning and control across the site.

Procedures to implement the standard are in draft for all departments/divisions, and most facilities have implemented the procedures on a trial basis to test and refine the procedures. Implementation of department/division procedures to meet the Laboratory standard is being monitored by a sitewide committee composed of formally assigned work control managers. BNL has established milestone dates for final implementation of the procedures.

Weaknesses

Resolution of sitewide issues affecting work control, such as implementation of a building management system and stop-work procedures, has not been timely. Although there has been progress in proceeding toward consistent sitewide solutions to these issues both before and during transition to the new BNL contractor, no milestones have been established for issuing these procedures. Effective building management policies with appropriate implementing procedures and a consistent, sitewide stop-work implementing procedure are essential elements of a sound work planning and control system. These procedures have not yet been finalized at BNL.

Inconsistencies and documentation deficiencies associated with implementing the Laboratory work planning and control standard work permit indicate the need for improved implementation. A review of completed work permits and forms indicates that while they were generally used adequately, some deficiencies exist. Some of the deficiencies may have resulted from incomplete instructions, uncertainty on how to complete blocks on the new work permits, differences in how various groups use the forms, and deficiencies in the work permit form. The deficiencies

included such items as work scopes not detailed enough to determine all hazards, no place to record actual work performed, blocks improperly filled out, required blocks left blank, procedures not referenced, lack of post-work review, and inconsistent use of the post-work testing blocks. While some deficiencies may be expected during a pilot implementation period, increased attention is necessary to improve the process.

During an HFBR walkdown, evaluators identified implementation deficiencies in implementation of electrical hot-work permit procedures. Personnel were observed inside an electrical hot-work permit “control zone” with exposed conductive material on their persons, contrary to the posted personal protective equipment requirements. Review of the work activity identified additional deficiencies in the generic and supporting procedures.

Summary

Work planning and control are improving at BNL. Review of work package and hazard control documentation at AGS, NSLS, and HFBR indicates better consistency, more detail, and improved documentation. It is evident that the departments selected for review were active in improving work control processes. The use of a standard work permit process, familiar to all BNL personnel, should improve coordination and safety. Interviews indicate that facility management recognizes some benefit from formalizing work control and that improved control does not hinder efficiency. However, recently established initiatives are in the very early stages of implementation and will take time, energy, and commitment at all levels to develop and mature. Some initiatives, such as sitewide stop-work procedures, the revised lockout/tagout procedure, and the building management program, may need increased management attention to ensure timely promulgation and implementation. Consistent implementation of the new Laboratory work planning and control standard and the revised experimental review standard requires continued management attention to ensure consistent implementation. Facility walkdowns indicate that facility condition and housekeeping have improved since the 1997 integrated safety management evaluation. However, BNL and the Reactor Division need to promptly address deficiencies in implementing electrical hot-work permit procedures, and additional focus is needed on procedural compliance.

2.2 Radiation Protection

Background

The 1997 integrated safety management evaluation identified significant weaknesses in the BNL occupational radiation protection program. Foremost among these weaknesses were inadequate management direction and program guidance; poor flowdown of policies, procedures, and standards for radiological control performance; ineffective BNL and BHG assessment and corrective action programs; and deficiencies in the radiological control technician training and qualification program. Some of these deficiencies were subsequently evident in two particular incidents that resulted in a December 1997 Preliminary Notice of Violation from the DOE Office of Enforcement and Investigation. The investigation of these events also identified a trend of programmatic noncompliance with regulatory and procedural requirements at multiple BNL facilities over a period of time.

Results

Institutional Programs

Only minor improvements have been made in the BNL radiation protection program since the integrated safety management evaluation. Specific corrective actions taken after the evaluation were limited to the radiological control technician qualification and training issue. Although corrective actions related to training and qualifications and for the events leading to the enforcement action have been completed, these actions did not address the broader programmatic and management weaknesses. More importantly, subsequent assessments performed by BHG indicate that similar performance deficiencies persist and that corrective actions have not been fully effective in achieving needed improvements.

Since taking over the BNL contract, BSA has appointed a new Director of Environment, Safety, Health, and Quality and a new Environment, Safety, and Health Services (ESHS) Division Head who serves as the BNL Radiation Control Manager. BSA has also begun a few institutional level initiatives. These initiatives include conducting a 10 CFR 835 gap analysis to determine the regulatory compliance status of the BNL occupational radiation protection program and its field implementation; reviewing and revising Facilities Support Section (FSS) radiological control operating procedures; developing a radiological problem reporting system that includes provisions for stopping radiological work and revoking worker

qualifications; and improving the nuclear rules non-compliance reporting program.

Requirements Flowdown

Despite these initiatives, the department and facility radiation protection programs are still independently managed, without adequate direction or performance expectations from the institutional-level radiological control management. This lack of institutional-level direction continues to contribute to weaknesses in the facility-level radiological control programs. For example, recently identified deficiencies in the Reactor Division bioassay program can be traced to a lack of technical direction in the “Technical Basis for Tritium Dosimetry at BNL” and the absence of an FSS operating procedure for internal monitoring. The existing Reactor Division procedure on internal monitoring is not consistent with industry practices and could have resulted in underestimated doses for job-specific exposures. The draft revision to this procedure is still ambiguous and does not provide an adequate technical basis for job-specific bioassay sampling. In another example, ambiguous institutional-level survey requirements for the transfer and release of radioactive or contaminated material has led to repeated instances of non-compliance with 10 CFR 835.

Institutional-level expectations for implementing facility or department As Low As Reasonably Achievable (ALARA) programs and work permitting and review processes are also inadequate. Laboratory-wide procedures do not adequately address requirements for formal radiological work reviews, pre-job briefings, and use of additional technical work documents. This weakness was identified in both the 1996 Tier III independent appraisal and the 1997 integrated safety management evaluation, but has not been corrected. As a result, there continues to be excessive use of general radiation work permits that authorize different types of work to be performed under potentially wide variations in radiation and contamination levels. In some cases, line organizations have developed their own procedures to compensate for the lack of clear institutional requirements. However, in the absence of such guidance, the facilities generally lack adequate procedures for controlling respiratory protection, dosimetry, air sampling, routine survey requirements, radioactive material posting and labeling, and responses to alarms or abnormal monitoring results within their facilities. This lack of procedures is contributing to performance deficiencies in the field.

The recently initiated effort to revise the FSS operating procedures to provide more definitive implementing direction and guidance to facility FSS

technicians and supervisors is a critical first step toward a well founded radiation protection program. To date, this initiative has received adequate attention through working group meetings, held twice a week, that include FSS technicians, the head of FSS, the Deputy Radiation Control Manager, and BHG. Two of the more than 30 procedures were revised in the first month of this effort. However, a strategy for implementing these changes in the field has not been developed.

The 10 CFR 835 gap analysis, targeted for completion in March 1999, is another longer-term effort. The gap analysis, when completed, is intended to provide an action plan and recommendations for improving the BNL radiation protection program. However, it is not clear what benefit the gap analysis will provide in the near term to correct the fundamental programmatic and performance weaknesses that have been repeatedly identified. BNL has not used the abundant occurrence report and assessment information to target or prioritize areas for improvement. It is also not clear how effective the gap analysis will be in evaluating program implementation because the existing implementing procedures are simultaneously undergoing significant modification. Furthermore, the gap analysis will divert personnel resources that are already in short supply, and the analysis plan does not include direct participation by line managers or workers.

BNL managers have not identified or implemented any near-term actions for improving radiological work performance other than those resulting from specific incidents. BNL has not developed adequate mechanisms to establish, document, and communicate radiological performance expectations and requirements to line managers. The BNL Radiological Control Manual provides broad requirements and guidance on virtually all topics associated with the radiological control program. Line managers are expected to interpret and implement the complex provisions of this entire manual in their respective organizations. Additional site-specific direction has not been developed to clearly define the responsibilities and authorities for implementing each program element and how to successfully tailor that implementation to the operations, hazards, and organization of a particular facility or department. The BNL Safety and Environmental Administrative Policy and Procedures Manual (SEAPPM), which is a potentially viable mechanism for delineating such responsibilities, still has not been revised or deleted to eliminate conflicts among radiological control program requirements.

The ESHS Division has developed a draft procedure for stopping radiological work, suspending radiological worker qualifications, and documenting isolated or repeated instances of poor radiological work practices. Although development of this procedure is

a positive initiative, there are concerns with some of the designated responsibilities and coordination with the institutional policy and procedure. According to the draft procedure, FSS technicians have the responsibility for revoking a worker's radiological qualifications for poor performance. In addition, the technicians are not required to inform workers or their supervisors when cases of poor performance are documented in the FSS office logbook. The procedure has not been well coordinated with the draft stop-work program ES&H standard to ensure consistent application of the Laboratory stop-work policy.

Facility-Level Programs

There have been a few improvements in the facility-level radiological control programs, such as the AGS radiation work permit process. These improvements were implemented in response to a detailed management assessment of the AGS ALARA program in December 1997 and January 1998; they also address some of the deficiencies in radiological work control at AGS identified during the 1997 integrated safety management evaluation.

The Reactor Division has made improvements in the experimental sample irradiation hazard analysis and review process and is revising several division procedures related to radiation protection and control. However, almost all of these improvements have been instituted as a result of specific reportable occurrences. In addition, some of the revised procedures still lack adequate guidance and refer to outdated or incorrect requirements. For example, the draft revision to Reactor Division's administrative procedure 8.1 on radiological work permits and procedures has not been effectively coordinated with the new division work planning and control process. The procedure does not provide definitive guidance on the timeliness of radiological surveys, does not identify who is responsible for approving radiation work permits for lower-hazard jobs, is inconsistent with the radiation work permit form, contains an outdated reference to DOE Order 5480.11, contains an incorrect definition of a Very High Radiation Area, and does not define a "high hazard radiation area." In general, the Reactor Division documentation and control of work performed under radiological work permits warrant improvement to ensure that appropriate radiological controls have been established prior to performing work. These deficiencies resulted from the lack of institutional expectations and guidance.

Brookhaven Group

BHG oversight of the BNL radiation protection program has improved greatly since the beginning of

1998. BHG has hired two Certified Health Physicists to improve its oversight capability. BHG also completed two focused assessments addressing radiological training and contamination controls, and began a third addressing Laboratory-wide radiological posting and labeling. These assessments identified numerous and widespread deficiencies in the BNL radiological control program. Although continued attention is necessary, BHG has been diligent in its efforts to ensure appropriate resolution of the identified weaknesses and to foster overall improvement in the BNL radiation protection program. BHG personnel are also actively participating in the 10 CFR 835 gap analysis and the FSS procedure revision effort.

Assessments and Corrective Actions

The results of the BHG assessments were formally transmitted to BNL with a request for a response and corrective action plan for each assessment. The responses from BNL have not been timely, and the corrective action commitments do not address the root causes of the deficiencies or their programmatic impacts. For example, BHG determined that the formal response to the contamination control assessment was very limited in scope and not adequate to address the assessment findings. After BHG communicated this concern, BNL agreed to submit a more comprehensive response to the assessment. Similarly, corrective actions for the assessment of posting and labeling do not address one important finding (i.e., radiological workers were unfamiliar with posting and labeling requirements and could not identify the source of those requirements). One of the corrective actions commits to retraining the radiological control technicians in posting and labeling but does not identify root causes for weaknesses in the technicians' knowledge of requirements (the technicians had been retrained and qualified on this subject eight months earlier). The training assessment also identified continued weaknesses in the radiological control technician training and qualification program, despite the corrective actions implemented in 1997 in response to the safety management evaluation. Collectively, the information from these assessments indicates that the technician retraining and qualification program has not been fully effective in communicating site-specific radiological control requirements. In addition, planned corrective actions do not address the root causes of the deficiencies identified.

BNL's corporate oversight assessment process has not been adequate in identifying and correcting weaknesses in the radiation protection program. In June 1998, BNL commissioned a non-BNL team to perform the first corporate oversight assessment of certain BNL initiatives. Contrary to the findings of

this Oversight followup review, the assessment report states that the radiological control organization has been proactive in initiating corrective actions for issues identified in previous assessments. The information supporting this conclusion lists a number of actions that do not correspond to previous assessment findings. The report does not reflect the deficiencies described above and does not address the fact that many of the findings from the 1996 Tier III independent assessment have never been addressed or corrected (e.g., ALARA program, shielding use), were not adequately addressed (e.g., posting deficiencies), or were not addressed in a timely manner (e.g., oral boards for technicians). The report also indicates that progress in tracking corrective actions and meeting established milestones has been satisfactory. However, since no formal corrective actions plans were reviewed during the corporate assessment, it is not clear how this conclusion was reached. The assessment report mistakenly implies that the radiation protection program audits required by 10 CFR 835.102 must be independent assessments. The report also suggests that a matrix document linking 10 CFR 835 requirements to lower-tier BNL documents be developed during the gap analysis, but does not acknowledge that such a document already exists. BNL will require a more rigorous assessment process to identify and correct fundamental programmatic weaknesses.

Positive Attributes

BHG oversight of the of BNL radiation protection program has significantly improved. The BHG senior health physicist has completed two in-depth, focused assessments of the BNL radiation protection program and suspended a third such assessment due to the large number of deficiencies identified in its early stages. Findings from these assessments were formally transmitted to BNL by the interim BHG executive manager, who requested responses and corrective action plans. BHG personnel are also fully participating in the 10 CFR 835 gap analysis and the FSS procedure revision effort, and they routinely interact with both line managers and support personnel to discuss radiological control issues.

Baseline assessments of the technician-level resources needed to support line ES&H programs have been completed. These assessments are an excellent means of identifying and communicating the services provided to the line organizations by FSS personnel. In at least one department, the baseline assessment was instrumental in ensuring that the line organization would continue to fund an adequate level of ES&H support.

Weaknesses

The BNL radiological control organization still has not established the infrastructure, leadership, and management controls needed to ensure that basic radiological control requirements and standards are implemented and maintained. BNL has begun a few initiatives to improve the site-level radiation protection program. However, these initiatives do not address many of the current problems in the radiation protection program. With the exception of developing a radiological deficiency reporting procedure, BNL has not identified near-term actions that will improve the site- or facility-level radiological control processes. BNL also has not established an effective mechanism for communicating radiological control expectations and requirements to the line organizations or ESHS personnel to ensure appropriate implementation in local work control processes.

Deficiencies in the clarity and consistency of program procedures and implementing guidance are contributing to poor conduct of radiological operations. The line organizations have developed some of their own procedures to compensate for these deficiencies in institutional expectations. However, the generic nature and ambiguity of the ES&H standards and FSS operating procedures do not provide adequate guidance to ensure an appropriate level of radiological work control. As a result, workers and radiological control technicians do not always adhere to good radiological conduct of operations principles, such as surveying and monitoring, contamination control, radiological boundary and access control, and radiation work permit use.

Weaknesses in performing assessments and in managing and correcting documented radiation protection program deficiencies persist under BSA. Corrective actions for the three BHG assessments conducted in the past six months were not developed in a timely manner and do not address the root causes of identified weaknesses. Furthermore, a BNL corporate oversight assessment conducted in June 1998 failed to identify similar deficiencies.

Summary

Progress toward improving the BNL radiological control program has been limited. The weaknesses identified during the 1997 integrated safety management evaluation still exist, and a clear, comprehensive path forward for addressing these weaknesses has not been established. Weaknesses in the corrective action plans submitted in response to BHG assessments indicate inadequate senior management attention to these plans and a reactive approach to corrective actions. The BHG assessments,

as well as interviews conducted during this evaluation, indicate that in the absence of well documented and definitive procedural guidance, the BNL radiation worker and radiological control technician training programs have not been effective in establishing and communicating radiological control requirements. BNL managers need to develop a comprehensive strategy to address the fundamental, program-wide weaknesses that have been repeatedly identified by internal, BHG, and DOE Headquarters evaluations of the BNL radiation protection program. This strategy must critically address the root causes of the weaknesses in order to achieve long-term programmatic improvement.

BHG oversight of the radiation protection program has significantly improved. BHG has completed formal radiological control program assessments and is a key participant in the ongoing institutional initiatives. BHG personnel have significantly increased their presence in the facilities, interactions with line managers and facility support personnel, and oversight of facility radiological control activities and work practices. However, a more proactive BNL approach to correcting deficiencies and continued attention by BHG are necessary to ensure that BHG assessments result in the desired improvements in the radiation protection program.

2.3 Groundwater Protection

Background

In addition to the 1997 integrated safety management evaluation, which evaluated the BNL overall groundwater protection program, the Office of Oversight performed two other reviews that specifically addressed DOE efforts to identify the source of the tritium leak and mitigate the tritium groundwater plume at the HFBR. These efforts were the “Interim Evaluation of Tritium Plume Recovery Activities at BNL” and “Status of Groundwater Tritium Plume Recovery Activities at BNL,” which were completed in February 1997 and October 1997, respectively. The October 1997 followup review found significant progress toward identification and remediation of the tritium plume. The Environmental Protection Agency is also conducting a three-phase multi-media compliance inspection at BNL.

The 1997 evaluation identified significant concerns with the BNL groundwater protection program and a lack of compliance with DOE Order 5400.1 and Article 12 of the Suffolk County Sanitary Code¹. Weaknesses were also identified in defining

BNL groundwater management roles and responsibilities, particularly at the facility level. The BHG oversight process did not ensure BNL compliance with DOE Order 5400.1.

Results

Significant progress has been made in site remediation and groundwater protection activities. Since tritium was discovered in the groundwater south of the HFBR in early 1997, there has been a strong and continuing emphasis on identifying radiological contaminant sources, resulting in the discovery of new areas of groundwater contamination. BNL has taken definitive actions to characterize plumes and initiate interim remediation and control activities for the new source areas. A case in point is contamination related to the Brookhaven Linac Isotope Producer (BLIP) site. Routine monitoring identified tritium contamination of the groundwater, which was traced to this facility. Preliminary corrective actions were completed in a timely and efficient manner.

Institutional Programs

A performance-based management approach is presently being implemented at BNL. An institutional management plan to provide the framework for this approach is being developed around seven critical outcomes for the Laboratory, one of which is environmental cleanup. The management plan will provide objectives, performance measures, and metrics for each of the critical outcomes. Roles, responsibilities, authorities, and accountabilities documents and performance expectations in individual performance appraisal standards will eventually be linked to the critical outcomes in the management plan.

A Groundwater Protection Management Plan is under development to define the management elements necessary for a comprehensive program, as required by DOE Order 5400.1, but BNL has not yet issued it. An outline of the plan was examined for this review. Plan development has been behind schedule because of work on the HFBR tritium plume and others; completion is scheduled for October 1998. The plan will provide a blueprint for the better integration of groundwater activities of all kinds at the site and will address roles, responsibilities, and interfaces between the safety and line organizations. It will replace the now outdated management plan for the old Office of Environmental Restoration and Safety and Environmental Protection Divisions, dated June 10, 1996. A key feature of the planned Groundwater Protection Management Plan will be the Facility Use Agreement, which will make line management responsible for groundwater monitoring and evaluating

¹ Article 12 of the Suffolk County Sanitary Code regulates the storage, handling, and transfer of hazardous material that would contaminate the groundwater if it were released through a leak or spill.

facility changes for their impact on groundwater. Facility operation would be contingent on not polluting the groundwater. Facility supervisors view such agreements as formalizing the user's responsibilities for environmental protection. This approach, coupled with the planned performance-based management approach, shows promise in building environmental compliance into BNL facility operations. Besides the important management objectives, the plan will define a decision process to evaluate monitoring results and subsequent corrective actions. This process should provide a more consistent strategy for developing actions to address spills and cleanup.

BNL management recognizes the inefficiencies and logistical difficulties in maintaining parallel but different monitoring systems for facilities monitoring and remediation. For example, the use of different databases for water chemistry makes it difficult to integrate results, and the data collected from facilities-based monitoring programs differs from that in Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) programs. Furthermore, having different data sources makes it difficult to optimize the network (deciding which wells to make part of the ongoing monitoring system and which to abandon), and integrating the monitoring systems would improve quality assurance. Having different funding sources for facility and monitoring activities associated with restoration is a primary obstacle to integration.

Facility-Level Programs

The BNL Facilities Review completed earlier this year is an important step in groundwater protection and restoration. That review was a comprehensive evaluation of the facility features that could result in a hazardous material release and subsequent groundwater contamination. The review was performed by personnel from both BNL and BHG, as well as technical representatives from other national laboratories. The potential environmental vulnerabilities identified during the review were prioritized, and corrective actions were undertaken to address the high vulnerability areas. The Facilities Review also identified additional components that are classified as hazardous material storage facilities by Suffolk County and subject to regulation by Article 12. As a result of the review, the number of Article 12 systems at BNL increased from approximately 350 to 700.

The Groundwater Monitoring Improvements Plan For FY 1998 and FY 1999 is another important groundwater protection initiative. This plan identified current active facilities that could create groundwater contamination (e.g., AGS Complex, Building 912,

Relativistic Heavy Ion Collider) and recommended upgrades or improvements in the groundwater monitoring capability for these facilities. As a result of the plan, approximately 80 additional monitoring wells will be installed beginning in September 1998. The installation of these additional wells will address a weakness identified during the 1997 integrated safety management evaluation, as well as an area of noncompliance with DOE Order 5400.1 concerning weaknesses in the existing well network and overreliance on the restoration program for installing monitoring wells.

Interviews with AGS and Relativistic Heavy Ion Collider (RHIC) facility personnel demonstrated that there is a greater awareness and clear understanding of issues related to DOE Order 5400.1 and Article 12 compliance. Both facilities have undertaken significant infrastructure projects to reduce the possibility of groundwater contamination. There is a strong effort at BNL to upgrade facilities and related monitoring systems. Examples of these upgrades at the AGS include the addition of roofs over the beam dumps to reduce water contact with irradiated soils and the installation of computer-controlled shutoff valves on cooling loops to minimize the extent of spills in the event of system leaks. At RHIC, petroleum-based hydraulic fluids have been replaced with less-hazardous silica-based fluids. Environmental projects at the facilities are prioritized and must compete in the budget process with other changes in the physical plant. This situation is further complicated by the recent expansion in the number of systems subject to Article 12 requirements.

The 1997 integrated safety management evaluation identified a concern that facilities have not had a direct, active role in assuring groundwater protection even though the many systems in the facilities are potential sources of contamination. The 1997 evaluation report recommended that procedures (ES&H Standard and SEAPPM) be established for groundwater protection to implement DOE Order 5400.1 requirements at the facility level. Even though there is a greater awareness of groundwater protection issues, at the facility level, little progress has been made in developing these procedures.

Implementation of the BNL process evaluations project (PEP) also has provisions that strengthen groundwater protection. The PEP provides a project management approach to implement the memorandum of agreement between DOE and the Environmental Protection Agency. This project involves a Laboratory-wide review, with a goal of waste minimization, of all experiments and industrial-type operations to identify all waste streams. PEP will require an upgrade in the environmental knowledge of existing ES&H staff and the deployment of a team

of environmental professionals that would have specific responsibilities for environmental compliance and pollution prevention from the time the hazardous material is introduced until disposal.

Efforts are continuing to identify new sources of contamination and related problems. Radiological contamination has been identified at a number of sites, including the BLIP facility, the Graphite Reactor, and the Pile Fan Sump. Characterization projects undertaken over the last year have defined the scale and severity of these problems. In most cases, interim efforts at source control or removal have been undertaken. Efforts in assessing these problems have been timely, efficient, and appropriate. There is continuing progress in remediation of the plumes of volatile organic compounds (VOCs) and the examination of strategies to deal with the HFBR tritium plume and offsite VOC contamination.

Stakeholder Interface

Since the problem of tritium contamination at HFBR emerged, personnel in various departments have been active in presentations to community and regulatory agencies. The facilities review and followup activities by BNL were effective in responding to some Suffolk County concerns with respect to the storage of petroleum and hazardous substances. Although communications have improved with the addition of two Suffolk County inspectors who are now resident at BNL, relationships with stakeholders could be improved by a more effective and formal approach to providing information on cleanup progress. There are relatively few metrics for environmental improvement, and no publication provides multimedia risk assessments to clarify the ongoing risk of Laboratory operations.

Positive Attributes

There has been significant progress in remediating the site and protecting groundwater quality. New potential sources of contamination have been identified and characterized. The facilities review has clearly had an impact in identifying potential problem areas. Funding has been authorized for improving the monitoring network in relation to key operating facilities, such as the BLIP, AGS, and RHIC. Work is continuing to control the spread of the most important plumes at the site. An interim remedy is in place to control further migration of the tritium plume from the HFBR. Planning is continuing to address the most serious contamination problems related to offsite plumes of organic contaminants.

There is an increased awareness of groundwater protection issues at the division and department levels. The potential risks of contamination from facility operations at the BLIP and AGS are recognized. Physical changes to existing facilities are being made to reduce environmental vulnerabilities as funds become available. New facilities such as RHIC are being designed with issues of groundwater protection in mind. The performance-based management approach, when implemented, will place an important emphasis on environmental stewardship at all levels in BNL. Moreover, planning to implement the memorandum of agreement with the Environmental Protection Agency provides a mechanism to deal with pollution prevention at the Laboratory level.

Weaknesses

A comprehensive Groundwater Protection Management Plan has not been issued to define the strategy for efforts to protect and remediate groundwater at BNL. The plan is required to articulate roles and responsibilities in the areas of prevention, monitoring, restoration, and communication. The roles and responsibilities in the previous plan have become outdated by recent reorganizations and are not defined at the BNL department and division levels. In addition, the plan should outline a detailed decision process to evaluate monitoring results and corrective actions.

Groundwater protection requirements for tracking and monitoring potential sources have not been effectively established within facilities. BNL has not implemented a SEAPPM or ES&H standard for groundwater protection requirements.

Monitoring operations related to facilities have not been fully integrated with those associated with remediation activities at BNL. The most obvious problem involves inconsistencies among the databases used to monitor water quality monitoring data. Additionally, BNL has not developed integrated sitewide sampling protocols, quality assurance plans, and strategies that are consistent with both CERCLA and DOE monitoring requirements and objectives.

Communications both within BNL and BHG and with regulators and stakeholders are not fully effective. In spite of significant individual efforts in community education and improved interaction with Suffolk County inspectors, a more effective and formal approach is required to improve community understanding and confidence in BNL operations. A necessary first step will be the development and enunciation of a set of consistent cleanup goals among BNL, BHG, and others.

Summary

BNL has made significant progress in site remediation and groundwater protection. The BNL facilities review has promoted rapid progress in identifying new sources of potential groundwater contamination, and in developing a more comprehensive list of storage facilities requiring regulation by Suffolk County. There has been an aggressive examination of potential sources identified in the facilities review and a coordinated attack on problems requiring corrective actions. The facility environmental modifications and upcoming installation of approximately 80 monitoring wells represent important steps forward in overall sitewide groundwater protection as required by DOE Order 5400.1. The BNL Groundwater Protection Management Plan exists only in a draft form; work is in progress to complete it by October 1998. This plan will provide needed formalization of roles and responsibilities across BNL, particularly at the facility level, and a blueprint for integration of groundwater activities and for the decision process for evaluating groundwater problems.

2.4 Oversight and Assessment Programs

Background

The 1997 integrated safety management evaluation identified significant concerns with the quality, quantity, and effectiveness of BHG oversight and assessment activities. The lack of a formal, structured, and effective approach to performing assessments and oversight weakened the ability of BHG line management to ensure that the contractor and subcontractors were implementing ES&H requirements. The 1997 evaluation identified that clear expectations for line management oversight were not adequately communicated or understood. A lack of clarity and definition in ES&H roles, responsibilities, and authorities within the BHG organization adversely affected the BHG oversight and assessment programs.

Results

BHG has made progress in several areas of the oversight and assessment program since the 1997 evaluation. Many positive initiatives have been developed. Although most of these initiatives are in the early stages of implementation, BHG is using a structured approach for improving oversight and assessment activities.

BHG added staff and reorganized several times in 1998; the latest reorganization became effective on July 17, 1998. The Operations Management Division now contains all Facility Representatives and technical specialists. The Facility Representatives and technical specialists carry out ES&H oversight and assessment activities. These organizational changes have increased the technical oversight capability and improved the focus on oversight activities. However, at the time of this review, two important positions, a Facility Representative for the NSLS and an environmental compliance specialist, remained vacant because the full time equivalent (FTE) allocation was removed by an Office of Field Management strategic alignment initiative.

Mechanisms

BHG clarified the roles, responsibilities, and authorities for BHG personnel in an April 1998 BHG ES&H Management Plan and Operational Awareness Program guidance document. The ES&H Management Plan describes how BHG manages ES&H activities and issues at BNL. It incorporates topics such as the BHG vision; ES&H policy, requirements, and standards; roles and responsibilities; and training and qualifications. Oversight activities such as planning, ES&H/infrastructure prioritization and integration, monitoring activities, data analysis activities, feedback, performance measures, and BHG self-assessments are also addressed in the plan. The plan is being implemented, but due to the recent BHG reorganization, it no longer reflects the current organizational structure. The Operational Awareness Program document defines how BHG intends to maintain awareness of the status of programs and operations at BNL. BHG intends to use the Operational Awareness Program document as a source document for the development of specific BHG implementing procedures.

BHG has a series of office procedures that address a variety of topics, from the conduct of surveillances and walkthroughs to qualification and training. Although these procedures are still in effect, many are no longer used. BHG completed an analysis to determine whether each existing procedure should be revised, updated, or deleted, and is in the process of implementing the analysis recommendations.

Facility Representative Program

BHG is upgrading the Facility Representative program and has established Facility Representative positions in the following facilities: (1) HFBR and Brookhaven Medical Research Reactor; (2) AGS/RHIC; (3) NSLS; (4) scientific laboratory facilities;

(5) hazardous/waste and (6) plant engineering. In April 1998, BHG and BNL signed an agreement on the Facility Representative program to establish overall principles and mutual expectations. Although most Facility Representatives in these positions are relatively new and are still in the qualification process for their facilities, they have become actively involved in monitoring operations. As a part of their oversight activities, Facility Representatives accompany BNL ES&H personnel on inspections of their assigned facilities. Some Facility Representatives are attending meetings on the root cause analysis process at their facilities to improve consideration of management and programmatic root causes. Facility Representatives communicate observations and findings directly to facility and BHG management verbally, electronically, or via written correspondence.

Technical Specialist Program

BHG technical specialists provide expertise and experience in their functional areas. The technical specialists conduct assessments of BNL and effectively provide technical support to the Facility Representatives. BHG developed a partial FY 1998 Assessment Schedule, covering February–September 1998, that projected 45 assessments on a variety of functional areas (radiation protection, occupational safety, etc.) and topical areas (contamination controls, Resource Conservation and Recovery Act compliance, etc.). However, only a limited number of assessments have been completed, and there has been only a limited effort (except in radiation protection) to prioritize and complete the areas most in need of assessment. Assessment results are published in formal reports, which are forwarded to the contractor. Deficiencies/issues are entered into a BHG database and tracked until closure. Even though the FY 1998 assessment schedule proved unrealistic, the formalization of the assessment process, including the development of an assessment schedule and the use of a database for tracking findings, is a positive step in increasing the effectiveness and efficiency of the BHG monitoring and assessment activities.

In 1998 the BHG Operations Division instituted a biweekly report process to document and highlight facility ES&H findings and oversight activities. Initially, the report was a simple documentation of activities. Over time, it has evolved into a compilation of key issues, activities, occurrences, upcoming events, and support needs. Both the Facility Representatives and the technical specialists summarize their significant activities, observations, issues, and concerns in this document. The report is written for

the Operations Management Division Director, and copies are provided to the Group Manager, Deputy Group Manager, and BHG Division Directors. The Director shares the information informally with his BNL ES&H counterpart. BHG recognizes the need for a more formal means of communication of such operational awareness information.

Issues Management

A positive initiative is BHG's initial use of data management and analysis tools. Three primary data management programs are used. A Facility Observation Trending Database, developed for use by the Facility Representatives, is intended to capture, track, and close observations and findings derived from facility walkthroughs and surveillances. The BHG Issues Management System tracks findings from assessments and specific formal commitments for corrective actions made by BNL, as well as programmatic commitments made by BHG. Another database is used by BHG personnel to track corrective action commitments for Occurrence Reporting and Processing System (ORPS) reportable events. These databases are excellent tools, but they are not yet fully utilized by all BHG staff. And although computerized trending of the data is available, this feature is not routinely used. BHG plans to train the staff and expand the use of the system.

Positive Attributes

A formal ES&H Management Plan for BHG was developed and published in April 1998. The formalization of BHG's plans for the management of ES&H activities strengthens the organization's role in integrated safety management and brings focus and coordination to the ES&H oversight program.

An expanded, full-time Facility Representative program was initiated. The presence of full-time Facility Representatives in the field enhances the ability of BHG line management to remain cognizant of facility activities and events and to provide definitive ES&H oversight.

The presence and involvement of BHG personnel in overseeing field activities, including hazard identification and work control and planning, have significantly increased since the 1997 integrated safety management evaluation. BHG personnel are noticeably walking down the facilities, becoming involved in field activities, accompanying BNL ES&H personnel on inspections, reviewing documents, and observing work activities.

Weaknesses

BHG procedures do not reflect the current BHG organization and activities. The procedures addressing such areas as conduct of performance assessments, surveillances, walkthroughs, the Facility Representative program, and qualification and training are still in effect. They are no longer being followed, and they are being revised.

A formal mechanism for communicating operational awareness results to the contractor has not been established. Issues and deficiencies identified during operational awareness activities by Facility Representatives and technical specialists are provided informally and verbally. Assessment results are communicated by formal reports to BNL.

Summary

BHG oversight and assessment activities have evolved significantly since the 1997 integrated safety management evaluation. However, this evolution is not complete. Many positive initiatives have been developed, most of which have not yet reached maturity. Many are in the very early stages of implementation; the overall effectiveness of the programs will be hindered until full implementation is achieved. In the interim, BHG is using an acceptable approach for improving oversight and assessment activities.

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Appendix A

BNL Followup Review Team Composition

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